

DIAMOND TOOLS

**NORTON
ADVANTAGE**

Grindwell Norton's new plant in India brings you Saint-Gobain Abrasives' Superabrasive products. Trained product specialists can support you to get the best of your grinding process and offer you a grinding system solution. A wide range of items ensure easy availability.



TYPICAL APPLICATIONS

- ▶ Bore grinding (using small wheels)
- ▶ Profile grinding
- ▶ Low cost option in place of Multipoint Dressers for Surface grinding
- ▶ Double disc grinding
- ▶ Cylindrical grinding
- ▶ Centreless grinding

Single Point Dressers

The dressing tool performs the key functions of dressing and truing thereby ensuring the productivity and quality and hence, is a key component in the grinding system. Only a correctly chosen and properly used dressing tool allows full utilization of the abrasive and the machine. Maintaining tight tolerances, repeatability of dimensions and automation in grinding and dressing depend on the usage of a good quality dresser.

In spite of a comprehensive range of dressing tools available today, single point dressing continues to take a major chunk of usages as it remains the most versatile dressing solution. It is very difficult to replace single point dressers even today, unless the demands on quality, productivity and cost are critical and consistently is an issue. The quality and reliability of single point dressers depend significantly on the quality of diamonds used. There are no international standards for diamond quality and much depends on the consistent supply of good quality tools from the supplier. Grindwell Norton offers a range of single point dressers, optimally designed to give you consistent and reliable performance.

Availability

Single point dressers are offered by Grindwell Norton in three different categories:

- ▶ **PNS Type dressers** use a standard quality throwaway type diamond with a rugged shape and bruted point. They are economical and long lasting.
- ▶ **SC Type dressers** are available with superior quality diamond and 2 settable points.
- ▶ **Gem Type dressers** are made with crystal clear, high quality diamond in smaller carat sizes with natural points. These dressers are best suited for applications when continuous dressing is required.

The dressers are stocked in standard shank sizes of 12.5 mm x 150 mm. They are made to other shanks on request.

STOCK AVAILABILITY

Carat	NS	SC	GS
0.05			GS005
0.07			GS007
0.10			GS01
0.15	PNS1		GS1
0.20			GS02
0.25	PNS2	SC2	GS2
0.35	PNS3	SC3	GS3
0.50	PNS5	SC5	GS5
0.75	PNS7	SC7	
1.00	PNS10	SC10	
1.50	PNS15	SC15	
2.00	PNS20	SC20	
2.50	PNS25	SC25	
3.00	PNS30	SC30	
3.50	PNS35	SC35	
4.00	PNS40	SC40	
4.50	PNS45	SC45	
5.00	PNS50	SC50	

SpecCheck

SELECTION OF DIAMONDS

The selection and classification of diamonds require a lot of experience and access to best quality sources of buying.

Diamonds used for dressing are graded as follows:

- ▶ Regular octahedron shape with 4-6 points used in gem quality GS dressers with best mine sources.
- ▶ Round shape bruted to give a good point and accurate centrality used in SC type bruted dressers.
- ▶ Cubic shape regular, base quality throwaway type, with one bruted set point used in NS type dressers.

Performance of diamond dressers depends significantly on the quality of diamond used in the tool. Grindwell Norton dressers use optimally selected diamonds from the best sources.

Grit Impregnated Dressers

Diamond Grit Impregnated Dressers also called Nib dressers are made with a number of fractional carat diamonds set in a matrix bond. The cost per carat of crushed diamonds used in these dressers is lower than the whole diamond crystal used in single point dressers. These dressers dress quickly as a number of diamonds work on the wheel face simultaneously. These dressers produce an even, rib free grinding wheel face. Since the amount of exposed diamond remains the same throughout the life of the dresser, the dressing action is consistent and generates uniform dressing surface. This means that the grinding wheel is consistently sharp and cuts freely even after repeated dressing. The work piece is ground to the same tolerance and surface finish.



TYPICAL APPLICATIONS

- ▶ Cylindrical Wheels
- ▶ Centreless Wheels
- ▶ Roll Grinding Wheels
- ▶ Side Dressing Crank Wheels
- ▶ OD Dressing Thread & Gear
- ▶ Dressing Rubber Bond Wheels

ADVANTAGES/BENEFITS

- ▶ Long life with reduced dressing costs
- ▶ Self sharpening ensuring complete use
- ▶ Fast dressing as diamond is continuously exposed
- ▶ Less abrasive lost due to dressing - More parts per dress
- ▶ Need no resetting and truing
- ▶ Entire diamond matrix is usable

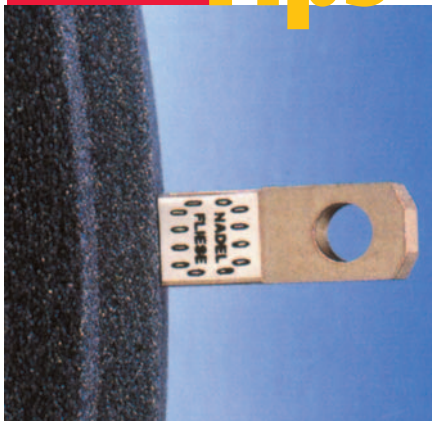
PARAMETERS

- ▶ Traverse rates: 5 mm/sec to 10 mm/sec
- ▶ Depth of cut: 50 to 70 microns for initial dressing
- ▶ 15-35 microns for regular

STOCK AVAILABILITY

Stk Code	Head Dia	Wheel Dia	Wheel Thickness
HSG6	6	<300	<40
HSG8	8	300-400	40-50
HSG10	10	400-500	50-75
HSG12	12	500-600	75-100
HSG15	15	>660	>100

TechTips



Carat selection - The diamond used in the dresser should be large enough so that it has enough surface area to be held well in the shank. Where higher dressing infeeds and traverse rates are required, the carat size of diamond must be higher. Multiply the diameter (in mm) of the wheel by its thickness (in mm). Refer the above value to the chart that follows and select the carat size of diamond. This is a rough method.

Carat	0.35	0.5	0.75	1.0
Upto	6000	12000	25000	and above
	6000	to 12000	to 25000	

Given above is a rough guide. Use multipoint dressers above 1.0 carat for best results.

Fliese Dressers

Fliese dressers are the most versatile and cost effective type of stationary multipoint dressing tools available for modern high productive dressing. Fliese dressers comprise of a thin layer of high quality diamonds, in different forms depending on the usage and application, set in a matrix. Fliese or Blade Tools can give 4-10 times higher feed rates of dressing compared to Single Point Dressers and 5-20 times life. The manufacturing process and technology of Fliese dressers ensure that consistent finish could be obtained at very low wear rates of the diamond. Fliese dressers combine the productivity aspects of Nibs, Igel tools and precision dressing capabilities of single point and Chisel dressers to offer unmatched versatility.

Plants for Fliese dressers

Fliese dressers are made in world class Saint-Gobain facilities in Europe. These dressers are backed by pre and after sales service expertise in India from Grindwell Norton who has an extensive network of branch offices aided by technical support from Bangalore in India.

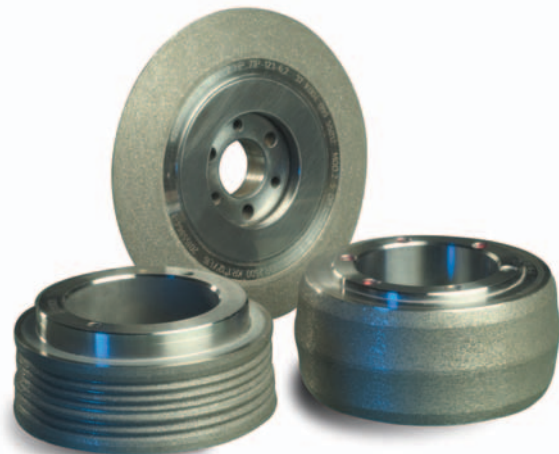


TYPICAL APPLICATIONS

- ▶ Cost effective option for Cylindrical grinding and angle head grinding where the precise controls and consistencies are required on finish and raddi

Rotary Dressers

In addition to Stationary Dressers, Grindwell Norton also offers the full range of Rotary Dressers. Rotary Dressers are generally custom built to specific customer applications and machines.



TYPICAL APPLICATIONS

▶ Automotive

- Crankshafts
- Camshafts
- Piston rings
- Oil seals
- Rocker arm guides
- Valves
- Valve needles
- Water pumps
- Expansion bolts
- Gear shafts
- Pinion gears
- Gears
- Spined shafts
- Clutch bearings
- Clutch release rings
- Synchronesh rings
- Oil pump worm wheels
- Universal joints
- Bearing outer races
- Cross pins
- Ball joint journals
- Ball screws
- Servo steering pistons
- Toothed racks
- Stub axles
- Propeller shafts
- Propeller journals
- Ball races
- Ball cages
- Threads

▶ Turbine

- Rotor shafts
- Guide valves
- Rotor blades

▶ Bearings

- Inner and outer rings
- Spherical races
- Cylindrical races
- Tapered races
- Crowned races

▶ Tools

- Screw taps
- Thread rolling dies
- Collet chucks
- Drill bushes
- Broaches
- Clamping jaws
- Quick change holders

▶ Hydraulics

- Piston Rods
- Piston Valves
- Rotary Pistons

What is a Rotary Dresser?

A Rotary Dresser is a high precision form tool consisting of diamonds strategically positioned around the periphery of a metal core and held in place by a metal matrix. In use, these Rotary dressers are rotated by means of a precision spindle and either plunged into a grinding wheel imparting the form to be dressed or traversed across the wheel to generate the desired form. Being accurate, Rotary dressers need careful selection of the best quality diamonds and state-of-the-art precision equipment to manufacture and inspect the form on the dressers.

Advantages of Rotary Dressing

- ▶ Profiling/truing and dressing of the wheel could be done in one operation
- ▶ Reduction in dressing cost per piece especially for high volume production and/or applications where high profile accuracies are needed
- ▶ Higher utilization of machine capacity
- ▶ Automation in dressing
- ▶ Consistent quality with low rejection rates
- ▶ Rapid transfer of accurate profiles
- ▶ Part accuracies less than one micron
- ▶ Reduced dresser setup changes
- ▶ Improved process control

Economics and Technical aspects

The advantages of diamond Roller Dressers have enabled rapid breakthroughs in usages especially in large scale production jobs. In some applications complete automation of parts become possible only by using rotary dressing. Stationary dressers have to be indexed or replaced and corrected for dressing in-feed changes very often resulting in frequent set up changes.

The main reasons for the usage of these tools are:

- ▶ Increasing automation in production
- ▶ Reproducible manufacturing accuracies
- ▶ Introduction of Flexible Manufacturing Systems (FMSe)
- ▶ Shortage of skilled labour in series production
- ▶ Rising machine and labour costs

DRESSER TYPES

CDP Handset Layered Pattern

CDP Handset Dressers utilise a single layer of diamond set by hand around the periphery in a specific interlocking pattern according to application. The diamond size and spacing is adjusted to suit the job. High wear areas like small radii and corners are reinforced with stones using various shapes. These are used for less accurate forms.

CDP Handset Random Pattern

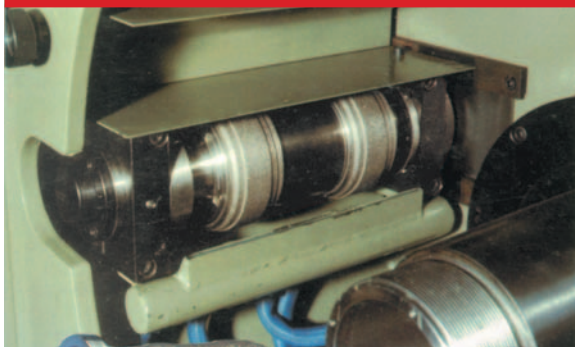
CDP Random Set Dressers also have a single layer of random set diamonds. These dressers are similar to layered hand set but are suitable for less accurate profiles. However, some dressers can be bond relieved to project diamonds.

RPC Reverse Plated Dressers

Accuracies less than one micron can be produced on these dressers. These dressers are hence recommended for high precision applications like bearing track grinding, turbine root profile grinding, etc. Reverse Plated Dressers are manufactured by a special precision electro-forming process. This process requires no furnacing and hence requires little or very less diamond lapping to produce even very accurate profiles. As the diamonds are not normally lapped they are very sharp. In this process high concentration of diamonds are randomly distributed. Diamond size can be varied to suit application.

Rotary Dressers are made in world class facilities in Saint-Gobain plant locations in Europe and USA. Grindwell Norton offers the full range of all types of Rotary dressers. Rotary dressers are generally custom built to special customer applications and machines. These dressers are backed by pre and after sales service expertise in India from Grindwell Norton through their extensive network of branch offices aided by technical support from product specialists from Bangalore.

HOW TO ORDER?



- ▶ For standard dressers, specify Stock No.
- ▶ For special dressers, specify diamond type, shank details, and dressing applications
- ▶ Enclose drawing of dressers showing details wherever possible
- ▶ For special dressers, preferably send used samples for cross matching.